

INTEROFFICE MEMO

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SUBJECT: Army Air Forces Photo Intelligence Course, Temporary duty in

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I. Summary

This report covers the period 19 April to 15 June 1944 during which the writer attended the Photo Intelligence course of the Army Air Forces School of Applied Tactics at Orlando, Florida.

Purpose of attendance was the acquisition of general aerial photo interpretation ability and additional source materials on the Far East. Emphasis was requested by the Far Eastern Division on the interpretation of terrain, beaches, industrial installations, transportation, shipping, and bomb damage assessment. The course was successfully completed, special instruction was received in the emphasized subjects above, several general and photo interpretation sources were brought back, the collaboration of the Photo Intelligence staff on research projects was solicited, and the writer gave the staff aid on the existence and location of sources of ground information.

Ten days were spent in orientation. The first 3 of these included study of the organization of the Army Air Forces and the missions of its components. The other 7 days covered a brief course in Combat Intelligence.

The remaining 6½ weeks were spent in excellent and highly organized instruction in aerial photo interpretation. This was divided into 7 parts: basic, general, air, army, industry and transportation, naval, and special problems. About 75-80% of the photos used were European due to the lack of Far Eastern coverage. However, the writer requested and received additional instruction on the interpretation of a limited assortment of Far Eastern photos.

Three types of material were obtained: (1) a photo interpretation kit and good visual and textual references on the identification of all types of subjects (issued to all students); (2) material for photo interpretation instruction in terrain and industry (good exemplary photos and additional references not issued to students); (3) general textual or visual source materials of value to anyone in the Far Eastern Division (forwarded to Washington in weekly reports).

Many contacts were established, particularly with the research personnel of the Photo Intelligence Department. These resulted in 2 of the staff members coming to OSS (2 more are expected) and the acquisition of material not available otherwise. Also, the Far East Division will receive more photo interpretation reference material from Orlando in the future.

II. The Orientation Courses

A. General. Illustrated lectures were given in the first 3½ days on the organization and function of the AAF and its intelligence arm. The following topics were covered:

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- (1) the AAF School of Applied Tactics (at Orlando, 2 years old, includes Photo Intelligence course and some 45 others)
- (2) AAF chain of command and the theater air forces
- (3) command and employment of strategic and tactical air forces
- (4) Air Service Command
- (5) strategic and tactical air reconnaissance
- (6) airdrome and general security
- (7) use and effectiveness of anti-aircraft artillery
- (8) troop carrier aviation
- (9) treatment and disposal of prisoners of war, captured documents and materiel
- (10) organization of capture intelligence work in the theaters
- (11) avoiding capture, avoiding interrogation and escaping
- (12) Japanese and German military and civilian psychology
- (13) theater front situations
- (14) AAF intelligence publications
- (15) details of amphibious operations.

B. Combat Intelligence. A one-week summary of an eight-week Combat Intelligence course, given concurrently with Photo Intelligence, followed the general orientation. This covered:

- (1) map projections, coordinate systems, interpretation, and use
- (2) basic aerial tactics
- (3) aircraft performance characteristics
- (4) the operations of the Army ground forces
- (5) types of bombs and bombing (including a 1/2-day demonstration of all AAF weapons and their use)
- (6) compilation and use of target charts
- (7) German and Japanese anti-aircraft artillery characteristics
- (8) strategic air bombardment of Germany
- (9) basic fighter plane tactics
- (10) weather
- (11) flak analysis
- (12) aircraft recognition techniques
- (13) function and use of radar
- (14) briefing and interrogation of air combat crews
- (15) organization and tactics of German and Japanese air forces
- (16) security of intelligence.

III. The Photo Intelligence Course

A. General. The 103 prospective photo interpreters were divided into two equal squadrons and these subdivided into three equal flights each. Instruction was intended to be on the strategic level. Classes were given by squadrons, each receiving the same instruction eventually, and once a week the flights met individually with flight advisors. Two hours per week were devoted to instruction or courses in the War Room (similar to the OSS Situation Room). In addition, all students took 5 hours of physical training a week.

Numerous multigraphed instruction and "clue" sheets were issued by all photo interpretation sections. These are filed by subject with the writer's class notes.

B. Basic Section. Forty-two hours of instruction were given in the fundamentals of interpretation. This covered:

- (1) the history, role, capabilities, and limitations of photo intelligence
- (2) stereovision
- (3) use of slide rule
- (4) drafting
- (5) aerial photo scales
- (6) aerial photo plotting and indexing
- (7) terrain interpretation
- (8) shadow interpretation
- (9) height finding
- (10) assembly of mosaics
- (11) operation and use of various aerial cameras
- (12) construction of perspective target charts
- (13) economic geography of Germany and Japan
- (14) sources of ground information

C. General Section. Twenty-eight hours were allotted to work common to two or more specializations in photo interpretation. This included:

- (1) organization of photo intelligence and photo reconnaissance
- (2) preparation of photo intelligence reports on all subjects
- (3) camouflage principles and types
- (4) recognition of radio stations
- (5) classification of several types of German and Japanese radar and radio direction finding installations
- (6) use and recognition of dummies and decoys
- (7) bomb plotting from "strike" photos (taken at time of bombing)
- (8) damage assessment (degree of incendiary and high explosive bomb damage to all types of installations).

D. Air Section. Twenty hours were spent in the interpretation of airfields and all details related thereto. This included learning the function and identification of the:

- (1) landing area (size, lighting system, visual and radio homing devices, and obstructions)
- (2) servicing area (size, buildings and fuel and ammunition dumps)
- (3) dispersal areas
- (4) personnel areas
- (5) radio facilities
- (6) defenses
- (7) general type and number of aircraft present.

Special instruction was requested and received in recognition techniques for specific aircraft types.

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E. Army Section. Twenty-four hours were given to the study of the principles of location and the identification clues of German and Japanese army installations. These installations include:

- (1) anti-aircraft positions (light, heavy, dual purpose, fixed and mobile)
- (2) ground fortifications (trenches, bunkers, machine gun positions, anti-tank traps, etc.)
- (3) field artillery
- (4) coast defense
- (5) camps and supply installations
- (6) armored force vehicles and motor transport.

Some data and references on performance characteristics of tanks, guns, etc. were obtained.

F. Industry and Inland Transportation Section. Twenty-four hours of instruction were given on the recognition and classification of industries and inland transportation. Transportation instruction was divided between fixed installations (car repair shops, classification yards, road and railroad bridge types, canal locks, etc.) and rolling stock (locomotives, tankers, hopper cars, barges, etc.). Industry was divided into:

- (1) fuels
- (2) power
- (3) utilities
- (4) metals
- (5) assembly plants
- (6) chemical plants
- (7) miscellaneous industries.

The manufacturing process and plant layout of the major plant types in each of these was studied. Emphasis was put on the combinations of identification clues and probable primary target units of each heavy industry type. Installations studied were:

- (1) coal mines
- (2) coke and coke by-products plants
- (3) oil refineries
- (4) hydro and thermal electric plants
- (5) iron and steel plants
- (6) alumina and aluminum plants
- (7) artificial gas plants
- (8) water and sewage disposal plants
- (9) nitrogen, fertilizer and explosive plants.

Special instruction was requested and received on detailed identification of types of heavy industrial installations.

G. Naval and Shipping Section. Thirty-two hours were allotted to the techniques of naval, shipping and shipbuilding identification. This included:

- (1) naval and merchant vessel types
- (2) interpretation of Japanese and German naval and merchant vessels
- (3) port installations
- (4) shipbuilding
- (5) Japanese small craft and harbors
- (6) minor naval units
- (7) determination of the speed of ships at sea.

H. Special Problems Section. Twenty-six hours were given to three exercises in which all interpretation training was summarized. Photos of Wake Island, Linz, Austria, and Stettin, Germany were issued and interpretations of several types of installations were required in 6, 3, and 12 hours respectively.

J. The Air Intelligence Exercise. The last 4½ days were spent on the compilation of air objective folders on the Cherbourg, France area. Three Central Interpretation Sections were organized and operated as they are in the theaters. Also, a Target Information Section, commanded by the writer, was organized for the supply of ground information to and the interpretation checking of the Central Interpretation Sections.

K. Weakness of Instruction. The writer discussed with the Photo Intelligence Department and War Room Staff the apparent weaknesses in the instruction of terrain interpretation, naval and industry interpretation, and sources of ground information. In some detail, these are:

(1) Terrain interpretation instruction presupposed previous geological training and knowledge of existing ground information on areas under examination. Actually, only 6 hours was allotted to this subject, no ground information was issued for the class or home exercises and most of the students had little or no geological background. No direct photo interpretation techniques were taught, such as the measurement of slopes. The writer gained only knowledge of the form of terrain photo interpretation from instruction in this subject.

(2) Naval and industry hours of instruction are unbalanced. The 32 hours in naval instruction allows study to the tactical level in part, whereas the 24 hours in industrial instruction does not allow completion of study on the strategic level. As industry is more important strategically and more difficult for general interpreters to learn, it was suggested that the number of hours given the industry and naval sections be reversed.

(3) Instruction on sources of ground information was totally inadequate. That given in Photo Intelligence and by the War Room staff refers to U.S. and British periodicals (e.g., ONI Weekly) and supplementary sources (e.g., telephone books and maps). No mention was made of background sources like JANIS, ISIS, G-2 Strategic Surveys, Strategic Engineering Studies, etc., excepting a talk by the writer to his flight and to a member of the War Room staff.

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Only one JANIS (and a portion of another), a part of an OSS Topographical Intelligence Study, and a few ISIS volumes were found by the writer in a quick perusal of 3 classified libraries. The lack of knowledge of such publications by officers who had been or were going into the field was appalling; in view of this the failure to at least tell these men of the existence of such publications was the greatest single failure of the Intelligence Department Staff. The writer pointed out that such ignorance could not be most efficiently relieved by reliance on good distribution.

Excepting this source material instruction, it must be emphasized that the writer feels that this course was the best organized and best taught course he has ever attended. 6½ weeks of photo interpretation instruction, as concentrated and well done as this was, is only expected to turn out interpreters who are ready for apprenticeship in a Central Interpretation Section in some theater.

IV. Recommendations

The writer recommends the organization of a Photographic Intelligence Section in the Geographic Subdivision. Such a section could be organized in a short time by slight changes in the present setup of the Physical Geography Section and without loss of efficiency in the Subdivision. Further, this would increase the accuracy and completeness of reports from the present Physical Geography Section, the Geographic Subdivision and the Far East Division as a whole.

The functions of such a Photographic Intelligence Section would be:

- A. to service all Far East Division sections by the supply of current intelligence (e.g., target and terrain analyses) through the medium of photographic interpretation,
- B. to train Far East Division personnel intended for outpost duty in subjects to be recommended by Col. Hall and/or his deputies (Col. Hall has repeatedly asked for this in the past 9 months).

The Photographic Intelligence Section would be divided into the following 3 units:

- A. terrain and transportation
- B. industry
- C. port and urban

Aerial photographs from the Far East will be sent to Washington in increasing numbers. The Division should be ready to make use of these in its research program. Thereby, it would increase the accuracy, completeness, and speed of completion of both long and short-term requests by inclusion of the very latest data available.

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V. Materials Obtained

The following general and instructional materials were obtained:

- A. Standard F-2, Photo Interpreter's Kit
- B. Photos: 51 stereo pairs exemplary of industrial and transportation installations
- C. Photos: 61 stereograms, annotated, exemplary of terrain types
- D. Japanese Aircraft and Armament, A-2, Sept. 1943
- E. German Aircraft and Armament, A-2, Sept. 1943
- F. Photographic Interpretation Handbook, A-2 and ONI, 1944 (3 copies)
- G. Photo Intelligence For Combat Aviation, AAFSAT, 1944 (Confidential)
- H. 25 copies each of 12 industrial and transportation clue sheets
- J. 2 annotated photos of aircraft for technique of identification
- K. Japanese Naval Vessels, Manual, ONI
- L. British Naval Vessels Manual, ONI
- M. Japanese Merchant Ships, ONI
- N. Recognition Manual of Naval Vessels, ONI
- O. Recognition Manual of Aircraft, ONI
- P. Survival (in the Arctic, Tropic, Desert or Jungle), AAF
- Q. Intelligence Bulletin, G-2 (6 different issues)
- R. Tri-Metrogon Charting System, AAFSAT
- S. Combat Lessons, No. 2, USA
- T. Japanese Infantry Weapons, G-2
- U. Evidence in Camera, Air Ministry (23 different issues)
- V. Air Force Cameras, A-2
- W. AAFSAT Intelligence Reports, AAFSAT, (1 issue)
- X. Handbook for Combat Intelligence Officers, AAFSAT
- Y. Interpretation of Aerial Photographs, USA, Dec. 1942
- Z. Japanese Land Operations, G-2, Nov. 1942

More industrial clue sheets will be forthcoming from AAFSAT very soon. Also, the Research Section is now preparing material on the recognition features of aircraft and aircraft assembly plants and the Air Section is preparing a handbook on shadow interpretation. When completed, such additional material is forwarded to old students so the writer will have these on file.